Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. **(Currently Amended)** An apparatus for allowing a user to model ~~modeling~~ at least one aspect of a software artifact by using extension types, said apparatus comprising a processor and a memory storing code accessible by the processor to provide extension types, each extension type comprising an ordered tuple of a plurality of element types, each of the element types corresponding to different class hierarchies;

wherein said extension types are utilized to simplify implementation of data classifications.

2. **(Original)** The apparatus according to Claim 1, wherein each extension type comprises an extension or variation of element types.

3. **(Original)** The apparatus according to Claim 1, wherein said extension types are adapted to compose classes horizontally.

4. **(Original)** The apparatus according to Claim 1, wherein each extension type is adapted to masquerade as any associated element type.

5. **(Original)** The apparatus according to Claim 1, wherein each extension type is a subtype of its associated element types.

6. **(Original)** The apparatus according to Claim 1, wherein:

each extension type has a size corresponding to the number of elements associated with the extension type; and

given two extension types α and β , a sub-type relation $\alpha <: \beta$ is definable as follows:

$|\alpha| >= |\beta|$; and

$\alpha(0) <: \beta(0), \alpha(1) <: \beta(1), \ldots \alpha(|\beta|-1) <: \beta(|\beta|-1)$.

7. **(Original)** The apparatus according to Claim 1, wherein, with α being the extension type of a variable *p* and β being the runtime extension type of the object pointed by *p*, so that $\beta <: \alpha$:

a method dispatch *p.m* comprises starting at the element type $\beta(0)$ and walking up the class hierarchy of $\beta(0)$ to find the closest *m*, wherein if *m* is not defined in the class hierarchy of $\beta(0)$, then *m* is sought in the $\beta(1)$ class hierarchy and, if needed, in one or more iteratively successive class hierarchies, until found.

8. **(Original)** The apparatus according to Claim 1, wherein, with α being the extension type of a variable *p* and β being the runtime extension type of the object pointed by *p*, so that $\beta <: \alpha$:

a method dispatch p^*m comprises, for each element type $\beta(i)$, in the order $i=0, \ldots, |\beta|-1$, walking up the class hierarchy of $\beta(i)$ to find the closest m in $\updownarrow(i)$ and dispatching the method m (if found), whereby a type error arises if m is not defined in at least one of the class hierarchies $\updownarrow(i)$, $i=0, \ldots, |\beta|-1$.

9. **(Original)** The apparatus according to Claim 1, wherein, with α being the extension type of a variable p and β being the runtime extension type of the object pointed by p, so that $\beta <: \alpha$:

a method dispatch $p(1,3,4).m$ comprises reviewing only a class hierarchy of $\updownarrow(1)$, $\updownarrow(3)$, and $\updownarrow(4)$to find the closest m, wherein a type error arises if m is not defined in any of $\updownarrow(1)$, $\updownarrow(3)$, or $\updownarrow(4)$.

10. **(Original)** The apparatus according to Claim 1, wherein, with α being the extension type of a variable p and β being the runtime extension type of the object pointed by p, so that $\beta <: \alpha$:

a method dispatch $p(1,3,4)^*m$ comprises reviewing only a class hierarchy of $\updownarrow(1)$, $\updownarrow(3)$, and $\updownarrow(4)$to find the closest m in $\updownarrow(i)$ and dispatching the method m if found, whereby a type error arises if in any of the class hierarchies to which $\updownarrow(1)$, $\updownarrow(3)$, or $\updownarrow(4)$ belongs m is not defined.

11. **(Currently Amended)** A computer implemented method for allowing a user to model ~~of modeling~~ at least one aspect of a software artifact by using extension types, said method comprising the step of providing extension types, each extension type comprising an ordered tuple of a plurality of element types, each of the element types corresponding to different class hierarchies, wherein said extension types are stored in a memory of at least one general-purpose computer; and

wherein said extension types are utilized to simplify implementation of data classifications.

12. **(Original)** The method according to Claim 11, wherein each extension type comprises an extension or variation of element types.

13. **(Original)** The method according to Claim 11, wherein the extension types are adapted to compose classes horizontally.

14. **(Original)** The method according to Claim 11, wherein each extension type is adapted to masquerade as any associated element type.

15. **(Original)** The method according to Claim 11, wherein each extension type is a subtype of its associated element types.

16. **(Original)** The method according to Claim 11, wherein:

each extension type has a size corresponding to the number of elements associated with the extension type; and

given two extension types α and β , a sub-type relation $\alpha <: \beta$ is definable as follows:

$|\alpha| >= |\beta|$; and

$\alpha(0) <: \beta(0), \alpha(1) <: \beta(1), \ldots \alpha(|\beta|-1) <: \beta(|\beta|-1)$.

17. **(Original)** The method according to Claim 11, wherein, with α being the extension type of a variable *p* and β being the runtime extension type of the object pointed by *p*, so that $\beta <: \alpha$:

a method dispatch *p.m* comprises starting at the element type $\beta(0)$ and walking up the class hierarchy of $\beta(0)$ to find the closest *m*, wherein if *m* is not defined in the class hierarchy of $\beta(0)$, then *m* is sought in the $\beta(1)$ class hierarchy and, if needed, in one or more iteratively successive class hierarchies, until found.

18. **(Original)** The method according to Claim 11, wherein, with α being the extension type of a variable *p* and β being the runtime extension type of the object pointed by *p*, so that $\beta <: \alpha$:

a method dispatch *p*m* comprises, for each element type $\beta(i)$, in the order $i=0, \ldots, |\beta|-1$, walking up the class hierarchy of $\beta(i)$ to find the closest *m* in $\updownarrow(i)$ and dispatching the method *m* (if found), whereby a type error arises if *m* is not defined in at least one of the class hierarchies $\updownarrow(i)$, $i=0, \ldots, |\beta|-1$.

19. **(Original)** The method according to Claim 11, wherein, with α being the extension type of a variable *p* and β being the runtime extension type of the object pointed by *p*, so that $\beta <: \alpha$:

a method dispatch *p(1,3,4).m* comprises reviewing only a class hierarchy of $\updownarrow(1)$, $\updownarrow(3)$, and $\updownarrow(4)$to find the closest *m,* wherein a type error arises if *m* is not defined in any of $\updownarrow(1)$, $\updownarrow(3)$, or $\updownarrow(4)$.

20. **(Original)** The method according to Claim 11, wherein, with α being the extension type of a variable *p* and β being the runtime extension type of the object pointed by *p*, so that $\beta <: \alpha$:

a method dispatch *p(1,3,4)*m* comprises reviewing only a class hierarchy of $\updownarrow(1)$, $\updownarrow(3)$, and $\updownarrow(4)$to find the closest *m* in $\updownarrow(i)$ and dispatching the method *m* if found, whereby a type error arises if in any of the class hierarchies to which $\updownarrow(1)$, $\updownarrow(3)$, or $\updownarrow(4)$ belongs *m* is not defined.

21. **(Currently Amended)** A data storage device readable by machine, comprising a data structure stored on the device, the data structure being at least one extension type comprising an ordered tuple of a plurality of element types, each of the element types corresponding to different class hierarchies; wherein said at least one extension type allows a user to model at least one aspect of a software artifact to simplify implementation of data classifications.